

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in and relating to Applicators for Liquid Medicaments

I, GEORGE JOHNSTONE MILLIGAN of Croft Cottage, Kelvin Grove Farm, Constantia, Cape Province, Union of South Africa, a British Subject (a Citizen of the Union of South Africa) do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a device for applying liquid medicaments in controlled quantities.

It sometimes happens, that a medicament is required in a small dose in a rather small, defined region which is relatively inaccessible. For example, an aching tooth may require desensitization, or small gum ulcers may require treatment, or again teeth may require treatment with tooth protecting liquids. In such cases it is usually desirable that medicament should be applied to the affected regions only and not beyond, and in a small but adequate dose.

It is an object of this invention to provide means whereby a liquid medicament may be applied with certainty in a small dose to a rather small, defined, and/or relatively inaccessible region, and with safety even where the medicament is of an active kind such as toxic or corrosive.

According to the invention, there is provided an applicator for the treatment of small, defined or hard-to-reach regions with a liquid medicament comprising a length of bendable, translucent, capillary tube, a wick in one end of said tube and protruding therefrom for conducting the liquid contents of the tube through the protruding end of the wick, and the other end of said tube being adapted to be opened before use so as to expose the bore of the tube to the atmosphere.

The tube is preferably provided with a removable cap to cover the protruding end of the wick and adapted to engage sealingly with the tube, in order to prevent contamination of the wick and evaporation of the contents.

The volume of medicament contained in the [Price 3s. 6d.]

tube preferably does not exceed about 0.2 cc., and thus many liquids or solutions which may be rendered to adequate non-active concentrations in non-active volumes of about 0.2 cc. may be safely used when supplied in an applicator according to the invention.

For example, various combinations of liquids or solutions of the following and other pharmaceutical drugs or compounds, may be used in suitable concentrations with applicators according to the invention, for treating teeth, warts, ulcers, and the like. For example, 4% Sodium Fluoride solution in water, Creosote, Clove Oil, Chloral Hydrate and so on, may be used for desensitizing dentin.

Again, tooth protective solutions may be applied. Such solutions may be a 2% solution of Stannous Fluoride, or 2% Sodium Fluoride with 25% Glycerine in water.

Further, glacial acetic acid may be used in applicators for treating warts. Each wart may then be fully treated without going beyond it. And again 2% Gentian Violet solution may be used in applicators for treating mouth ulcers, and as a general antiseptic. By means of an applicator, defined regions may be treated without staining the whole or large regions of the mouth.

In this specification, a liquid medicament when referred to as "active" is intended to include toxic, corrosive, staining or colouring, or like quality, in undesirable degrees, and "non active" is intended to mean that the activity of the medicament has been rendered to a safe or desirable degree in concentration and volume.

Other features of the invention will become apparent from the following description of a specific embodiment, from the claims, and from the accompanying drawings in which like reference numerals refer to like parts.

Figure 1 shows an applicator with cap in plan view;

Figure 2 shows the applicator and cap of Figure 1 in sectional elevation;

Figures 3 and 4 show other applicators and caps separately in sectional elevation;

Figure 5 shows an enlarged pictorial view of the wick end of an applicator, the tube being shown broken off over the wick.

In the drawings, reference numeral 10 refers generally to a length of thin transparent tube of polyethylene, having a bore of 2 mm. and an outside diameter of 3 mm., and having a sealed end 12, either seal-welded, as shown in Figures 1 and 2, or sealed with a plug 13, as shown in Figures 3 and 4. About 0.2 cc. of a liquid medicament 14 is contained in the tube 10, in contact with wick 15 in end 11 of tube 10. Tube end 11 is adapted to receive polyethylene cap 16 to cover the wick 15 to prevent contamination and evaporation of liquid medicament 14. Cap 16 has a sealed end 17, either seal-welded as shown in Figures 1, 2 and 4, or plugged with a plug 18, as is shown in Figure 3. Tube end 12 and cap end 17 may be sealed in any other suitable way, however, if desired.

In use, the end 12 of a tube is rendered open to atmospheric pressure either by snipping it off or by withdrawing plug 13, the cap 16 is then withdrawn and the applicator is ready for use. The tube being thin and bendable reaches hard to reach regions requiring treatment and liquid medicament is painted or dabbed on to the regions requiring treatment in small dosages with certainty and safety, without unnecessary smudging on to areas not requiring treatment. The liquid will remain in the tube even if inverted, and so the applicator may be tilted in any way best suited to treat the required region, without fear of spilling the liquid.

For treating teeth with a protective solution, the region of the mouth around the teeth to be

treated is rendered dry with absorbent tissue, the teeth to be treated are then dried by applying an astringent or a drying agent, by means of an applicator if desired, and thereafter a tooth protecting solution is applied through an applicator. The tooth protecting solution is made up from 2 grams of sodium fluoride, 25 cc. of glycerine and sufficient water to give a final volume of 100 cc.

The glycerine acts as a spreader, and ensures that the tooth protecting solution covers a tooth effectively, i.e. even if the dabbing of the tooth did not fully cover the tooth.

In practice, any liquid medicament which is very toxic or corrosive when used or when available in volumes exceeding about 0.2 cc., may be safely used and applied, when applied in applicators, even by semi-skilled persons, such as parents treating their children or children treating themselves.

Depending upon the medicament used, or on the purpose, an applicator may be discarded after having been used once. But if an applicator is to be used more than once, then a cap may be provided at the other end, i.e. end 12 as well, and may be provided also with a wick if desired. Where the tube is transparent or translucent, the quantity of medicament in the tube is visible, so that the applicator may be discarded as soon as it is empty.

Examples of liquid medicaments and the purposes for which they may be used in applicators as described are given below. In each case care should be taken that the medicament does not react with the materials of the tube, cap or wick, i.e. the materials are neutral with respect to the medicament used. Thus for example a fluoride solution should not be used in a glass tube.

EXAMPLES

SOLUTION		CLINICAL INDICATION	
Sodium Fluoride (B.P.C. 1934) 2%	.. ..	(a) To desensitize dentin	
Glycerine B.P. 25% in water	.. ..	(b) To prevent dental caries	
Sodium Fluoride (B.P.C. 1934) 4% in water	.. ..	To desensitize dentin	
45 Stannous Fluoride 2% in water	.. ..	To prevent dental caries	
Creosote B.P. 1953	.. ..	To desensitize dentin	
Clove Oil B.P.	.. ..	To desensitize dentin	
Clove Oil B.P. and Menthol B.P. equal parts	.. ..	To desensitize dentin	
Liquified Phenol B.P.	.. ..	To desensitize dentin	
50 Clove Oil B.P.	}	To desensitize dentin	
Chloral Hydrate B.P. and			
Menthol B.P. equal parts			
Ammoniacal Silver Nitrate Solution (U.S.N.F.)	.. ..	To desensitize dentin	
Glacial Acetic Acid B.P.	.. ..	To remove warts	
55 Gentian Violet Solution 2% (extra Pharmacopoeia Vol. I)	.. ..	To treat mouth ulcers and as an antiseptic	
Chlorbutol B.P. 25%	}	To desensitize dentin	
Clove Oil B.P. 75%			
60 Eugenol B.P.C.	.. ..	To desensitize dentin and for use as a reducing agent after the application of Ammoniacal Silver Nitrate to produce silver deposits	
Liquified Phenol B.P.	} equal parts	To desensitize dentin	
65 Camphor B.P.			
Thymol B.P.			

WHAT I CLAIM IS:

1. An applicator for the treatment of small, defined or hard-to-reach regions with a liquid medicament comprising a length of bendable, translucent, capillary tube, a wick in one end of said tube and protruding therefrom for conducting the liquid contents of the tube through the protruding end of the wick, and the other end of said tube being adapted to be opened before use so as to expose the bore of the tube to the atmosphere.
2. An applicator as claimed in claim 1 and a removable cap over the protruding end of the wick engaging sealingly with the tube.
3. An applicator as claimed in claim 2, in which the bore of the tube has a diameter of about two millimetres.
4. An applicator substantially as described and as illustrated in the drawings.

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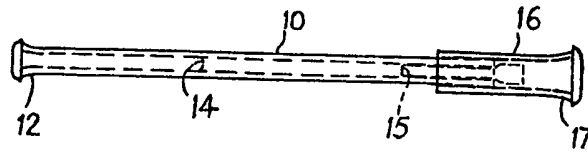


Fig. 1.

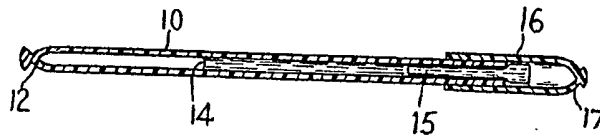


Fig. 2.

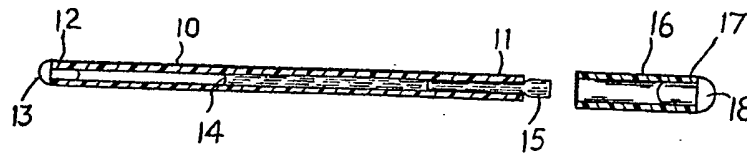


Fig. 3.



Fig. 4.

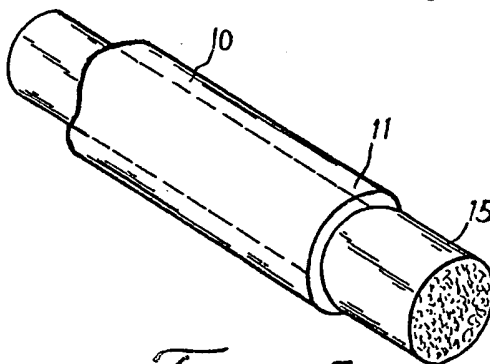


Fig. 5.